FLIGHT

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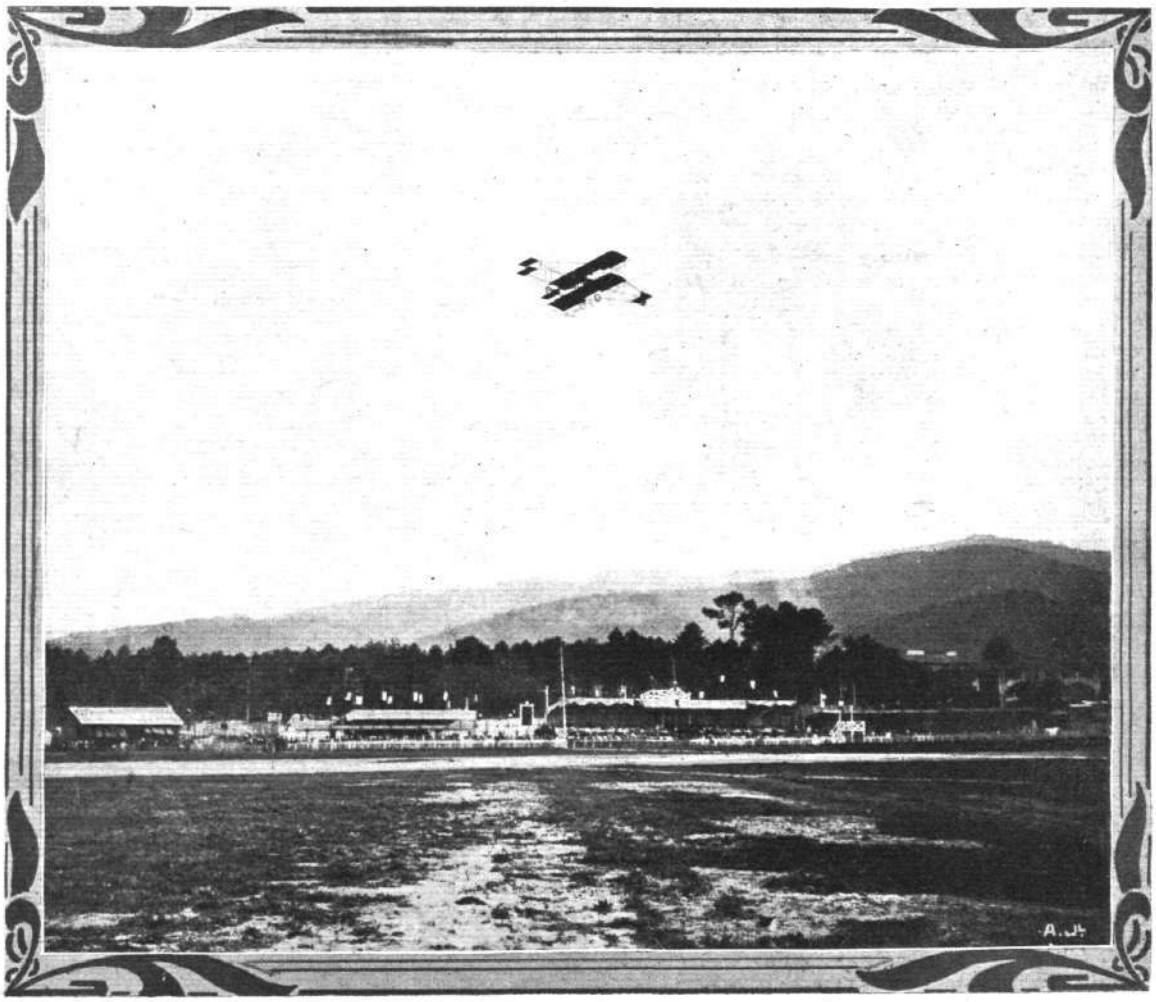


A fine flight by Reimsdyck on his Curtiss biplane during the successful Cannes Flight Meeting.

THE GREAT WRIGHT LAWSUITS IN AMERICA.

The two lawsuits, one with Curtiss and the other with Paulhan, recently decided by the American Courts in favour of the Brothers Wright, constitute the first judicial decision on the subject of aeroplane patents. It is not for this reason alone, however, that they are worthy of being put on record at length in FLIGHT, but rather because of the far-reaching and basic nature of the claims involved and also on account of the brilliant lucidity with which both Judge Hazel and Judge Hand summed up upon points of great subtlety in connection with the principles of aerodynamics as they are at present understood.

In order to curtail as far as possible the reprinting of the very lengthy evidence in the two cases, and in order, further, to elucidate the exact significance of the abstracts that are appended herewith, we purpose briefly explaining, in the simplest way that we can, what were the principal points at issue. Particularly would we draw attention to the fact that these technicalities are by no means of the "dry as dust" legal variety, but on the contrary are of the very greatest possible interest to all. Moreover, this is the first time that certain aspects of the aerodynamical problems associated with lateral stability have been brought to light, and the fact that simultaneously with their first public discussion there comes a judicial decision on the logic of the theories advanced is one that lends a still greater interest to the situation.

Balancing Planes-Warping.

Broadly stated, the cases decided were these: whether the pivoted balancing planes on the Curtiss machine, (see FLIGHT, Vol. I, p. 389) and the hinged balancing flaps on the Farman biplane as used by Paulhan (see FLIGHT, Vol. I, p. 641), do or do not constitute an infringement of the principle of wing warping employed on the Wright biplane (see FLIGHT, Vol. I, p. 568, and Vol. II, p. 174).

Both Judge Hazel and Judge Hand decided these devices to be infringements, and granted injunctions accordingly.

The points at issue involve considerations of theoretical and practical problems in aerodynamics, which were altogether beside the question as to whether the history of aviation disclosed anticipation of the Wright invention to exist in a prior state of the art. It is to the technical problem that we wish to make the first allusion.

The Swerving Effect of Warping.

In a previous article dealing with the Wright system of control we explained how the warping of the wings causes the machine to swerve from its course at the same time that it restores lateral equilibrium. The swerving is due to a difference between the resistances offered by opposite extremities of the planes as the result of a difference between their angles of incidence, which is artificially brought about by the warping. In order to keep the machine on its course it is necessary to operate the rudder, and the essential feature of the Wright patent, in the U.S.A. cases in suit, was the claim covering this combination of action, *i.e.*, steering with the rudder simultaneously with warping the wings.

The essential point in the Curtiss defence was that the balancing planes used on the Curtiss biplane, being so arranged as to have an equal and opposite angular movement from the neutral position, always offer an equal resistance; and, therefore, never exercise any swerving effect. On these grounds the Curtiss defence contended that the simultaneous use of the rudder with the manipulation of the balancing planes is unnecessary, and that in consequence the Curtiss system is fundamentally different in principle to that used by the Wrights.

Inequality in the Resistance of Balancing Planes.

Now the really interesting and important point which this case has been the cause of bringing to light is contained in the very subtle refutation of this defence by the Wrights, who argue that although the Curtiss contention may be valid as a theory for one particular and specified condition of flight, that such a condition of flight does not in effect obtain for more than one minute out of sixty, and that in consequence it is of insignificant importance.

The Wright argument was that the resistance offered by the Curtiss balancing planes is not equal unless the neutral position of those planes is also neutral to the relative wind, and that a simultaneous use of the rudder is therefore necessary whenever the balancing planes are manipulated under any other conditions. This theory was illustrated in Court by the accompanying diagrams, and was argued in the following manner:—

"In order to show the Court the true angular relations of the adjustable tips of defendants' machine to the wind, we present a corrected sketch marked 'Complainants' Diagram of Operation of Defendants' Machine.' Fig. 1 is the position shown by defendants' sketch, with one tip, XC, inclined downward 10 degrees from the normal position XL, and the other tip XC^1 inclined upward 10 degrees from the same line. Fig. 2 represents the machine with the motor throttled a little, in which case the main aeroplanes must be inclined a little more in order to provide support for the machine at the lower speed. The post B will then be inclined backward four degrees, and the neutral position XL will be rotated in the same direction four degrees from the horizontal, and the side rudders XC^1 and XC will likewise be rotated four degrees from the positions shown in Fig. 1. In fact, the entire machine will be rotated together four degrees from the original position. The angle of incidence of XC^1, which was originally ten degrees, will now be 10 minus 4, or six degrees, while the angle of incidence of XC will be 10 plus 4, or fourteen degrees. Although both rudders are adjusted to equal angles from the normal position XL, there is a difference of eight degrees in their angle of incidence. Under this condition the claim of Mr. Curtiss that the angles of incidence must always be equal when the rudders are adjusted equal distances from the normal position XL is manifestly untrue.

"Fig. 3 represents a case where the speed of the machine is still lower and the angle of incidence greater by eight degrees than in Fig. 1, and four degrees greater than in Fig. 2. This results is an angle of incidence on XC of plus 18, or eighteen degrees; while the angle XC^1 is 10 minus 8, or two degrees. Thus one tip will have nine times as great an angle of incidence as the other, instead of having equal angles."

Cambered Balancing Planes.

Incidental reference was also made to the fact that on an actual machine constructed by Curtiss the balancing planes were not, as a matter of fact, flat but were cambered; in which case the lack of equality between their resistances, at equal negative and positive angles of incidence respectively, is more readily obvious. The Curtiss affidavit in rebuttal of the above assertion, sought to show that the conditions illustrated in Figs. 2 and 3 only occurred instantaneously and not for a sufficient length of time to cause any turning of the machine. Also, that the practical result in actual flight is the same whether the

balancing surfaces are absolutely flat or are slightly curved.

Herring, however, made an affidavit in which the following statement occurs: "In my 1894 gliding machine I found it necessary to use the vertical rudder in preserving a straight course, when I corrected the side equilibrium by using the auxiliary surfaces," and this statement seems to contradict the Curtiss affidavit.

Fig 1.

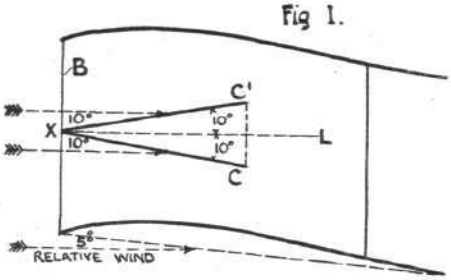
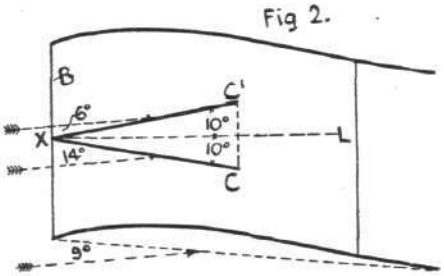


Fig 2.



The Wright Seventh Claim.

Judge Hazel, of the Circuit Court of the United States, in Buffalo, who granted on January 3rd, 1910, a preliminary injunction to the Wright Co restraining the Herring-Curtiss Co. and Glenn H. Curtiss from manufacturing, selling, or using for exhibition purposes the Curtiss aeroplane, quoted, in his summing up, the seventh claim of the Wright patent as the most important of those under consideration. This claim is as follows:—

"7. In a flying machine, the combination with an aeroplane, and means for simultaneously moving the lateral portions thereof into different angular relations to the normal plane of the body of the aeroplane and to each other, so as to present to the atmosphere different angles of incidence, of a vertical rudder, and means whereby said rudder is caused to present to the wind that side thereof nearest the side of the aeroplane having the smaller angle of incidence and offering the least resistance to the atmosphere, substantially as described."

Judge Hazel's Summing-up.

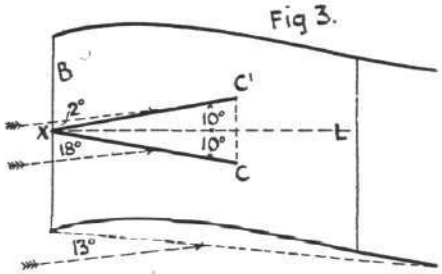
On the question of the difference or otherwise between the use of balancing planes and wing warping, which, as we have explained above, is the crux of the situation, the Judge makes the following observations:—

"Upon this contention it is sufficient to say that the affidavits for the complainant so clearly define the principle of operation of the flying machine in question that I am reasonably satisfied that there is a variableness of the angle of incidence in the machine of defendants which is produced when a supplementary plane on one side is tilted or raised and the other simultaneously tipped or lowered. I am also satisfied that the rear rudder is turned by the operator to the side having the least angle of incidence and that such turning is done at the time the supplementary planes are raised or depressed to prevent tilting or upsetting the machine. On the papers presented I incline to the view, as already indicated, that the claims of the patent in suit should be broadly construed; and when given such construction, the elements of the Wright machine are found in defendants' machine performing the same functional result. There are dissimilarities in the defendants' structure—changes of form and strengthening of parts—which may be improvements, but such dissimilarities seem to me to have no bearing upon the means adopted to preserve the equilibrium, which means are the equivalent of the claims in suit and attain an identical result.

Anticipation of the Wright Patent.

In the Paulhan case, which was also decided in favour of Wright on February 17th, by Judge Hand, of the United States Circuit Court, Southern District of New York, a considerable amount of evidence as to the different methods of manipulating the two machines in practical flight was brought forward; but the defendants appeared to rely mainly upon being able to prove anticipation of the Wright claims. Judge Hand dealt *seriatim* in a most painstaking manner with each

Fig 3.



suggestion of anticipation; and although he was of course only able to do so from the the American patent law point of view, his remarks are well worthy of study by British readers. They included designs or inventions by the following, among others: D'Esterno, Le Bris, Mouillard, Mattullath, Zahm, Ader, Bechtell, Graper, Johnson, Stanley, and Marriott.

Ader's Avion (see FLIGHT, Vol. I, p. 10) the Judge considered to be "the most serious attack upon the novelty of the patent in suit," but his decision was to the effect that:—

"If the invention be a combination at all, and not an aggregation, it is such solely by virtue of the apprehension of that vital relation of the parts, which Ader conclusively shows he did not have. Nothing but his description could more clearly show that with him the three (the two wings and the rudder) were in merely non-functional aggregation. Nothing can be more clear that in the (Wright) patent they are understood as in inevitable combination."

Judge Hand's Summing Up.

Summing-up, Judge Hand observed:—

"From the showing made I cannot doubt that the complainants (the Wrights) first put into any practical form the system of three rudder control. . . . I cannot find that anyone prior to their patent had flown with the patented system, and that the changes from the specifications which the defendant (Paulhan *re* the Farman machine) had made are no more than equivalents, which do not relieve him from infringement."

We should like to point out, in conclusion, that Judge Hand's reference to the "three rudder control" introduces the elevator, which is an essential organ of the Wright biplane and is an essential feature of the Wright patent, but was not much involved in the arguments of the contesting parties in these lawsuits. With reference to the importance of the cases themselves, and more particularly with their relationship to the situation in England, it is not our place to make any comment at the present time. But we feel that the intrinsic merit of the technical points discussed and the undoubted logic of the Judges who tried the cases—from an American standpoint—is more than sufficient warranty for the amount of space that we have devoted to the subject.

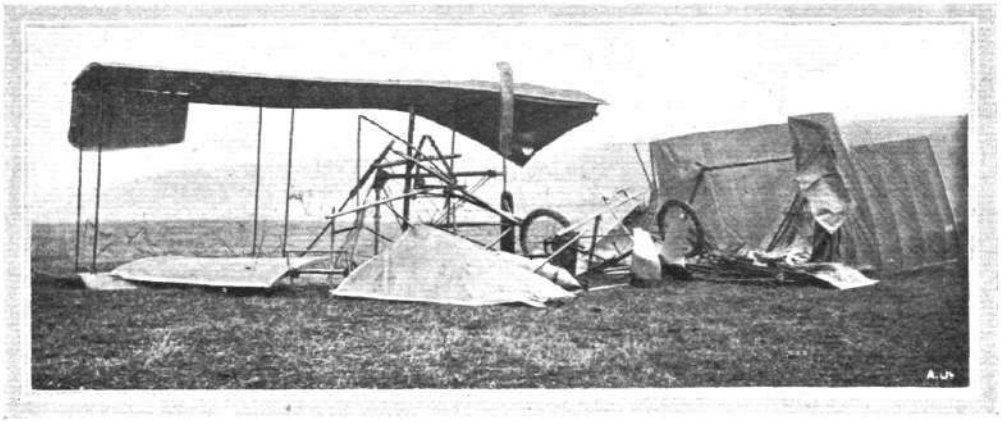
ANOTHER ALL-BRITISH BIPLANE.

DETAILS OF THE DE HAVILLAND MACHINE.

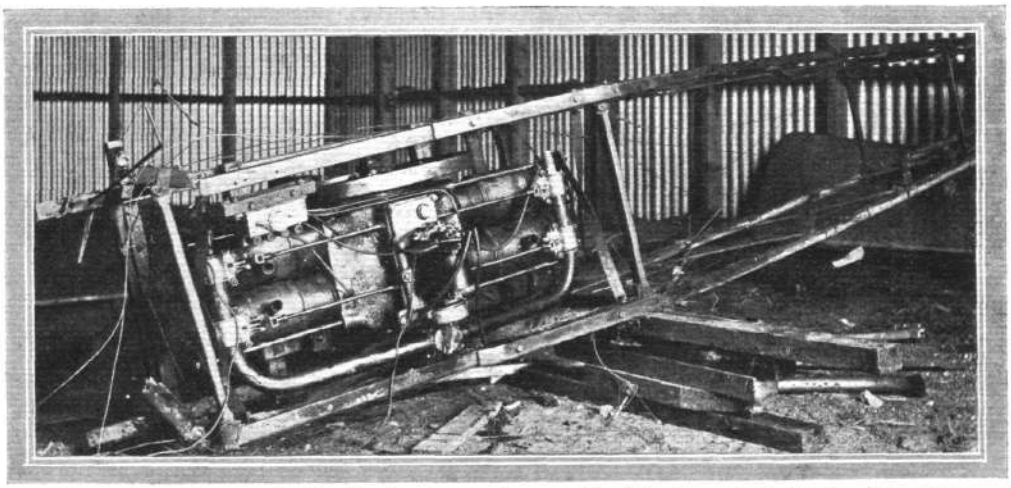
(*Concluded from page 268.*)

The Central Girder.

RUNNING from end to end, and causing the entire propelling mechanism to form a single unit with the elevator in front and with the tail and rudder behind, the large girder is built up of wood with metal clips and steel wires as indicated in our illustrations. The longitudinal members have a cross-section of 1½ in. by 1½ in. at the thickest part, and each is made in two parts, lap jointed at the centre, while beneath these members in the immediate neighbourhood of the engine are fitted angle-steel stiffening members, each of which is about 3 ft. 6 ins. long. At the widest place this girder is 2 ft. 4 in. wide by 2 ft. deep, while the lattice members at the rear (which are added subsequently to original intentions) are 1¼ in. wide by ¼ in. in depth. For carrying the propellers with their bevel gear, tubular members are employed branching out on either side of the main girder, and here it may be observed that the engine lies snugly with its comparatively short crank-shaft at right angles to the direction of travel, while continuation shafts are carried from both its ends to the bevel gear-boxes into which the longitudinal propeller-shafts also pass. A very compact substitute is thus obtained for the more usual chain drive, and an engine of the de Havilland type is thus caused to stow very snugly away.



The wreck of "Havilland I," denoting the inadequacy, as regards strength, of this 850-lb. machine.

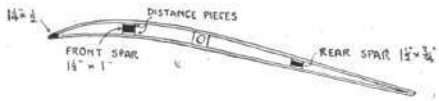


View looking down on the Havilland engine, as it appeared within the main girder after the smash.

The Main Planes.

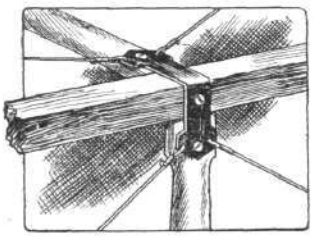
These are built up in four parts, each pair of which is bolted together by means of flitch-plates and is then

secured by bolts to the engine frame. Wooden spars are employed of the dimensions given in our separate sketch, and it will be observed that distance pieces are fitted between the ribs and the spars in order to give the latter a greater depth where the ribs are attached, and thus to prevent the fabric from sagging down between the ribs



Section through one of the main planes, indicating the dimensions of the wooden spars.

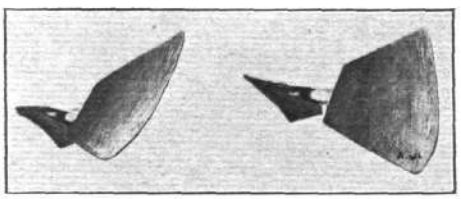
and assuming an ugly shape by resting on the spars. The arrangement of the thin webs between the two surfaces will also be noted, and, of course, it will be understood that a double fabric surface is obtained. Incidentally, we are told that a good deal of trouble was experienced with this particular fabric, owing to its tendency to contract in damp weather, even to the extent of distorting the planes, and to hang in festoons when the atmosphere was dry.



Sketch showing the neat strut joint for the main girder.

Eight pairs of vertical struts are arranged between the upper and the lower main planes, the distance between these planes being 6 feet, as may be observed from the drawing.

Also it may be added that the leading edge of the lower plane stands about 4 feet from the ground under normal conditions. As regards the wing tips on the upper planes, the plane which we give shows precisely the manner in which these are hinged, so as to be operated from the pedals that are situated in front of the pilot's seat.



Two views of the Havilland adjustable propeller, indicating the extent to which the pitch and the twist of the blades can be changed to suit requirements.

Elevator, Rudder, and Tail.

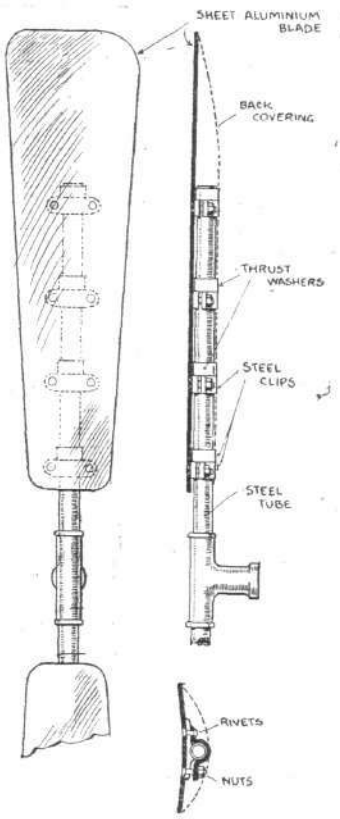
Each of these three members—the elevator, the rudder, and the tail—is formed with spars of steel tubing. The area and shape of each is clearly marked on the drawings, and it will be observed, moreover, that provision is made whereby the angle of the tail can be altered if necessary. For controlling the machine the elevator is coupled up to a hand lever on the left, while the rudder can be actuated from a lever on the right.

The Chassis.

Normally when the machine is resting upon the ground or is running along, it rests upon the three spring-suspended wheels that are anchored to the main frame by guide-rods and by forwardly mounted radius-rods. The two front wheels are, of course, arranged together in a kind of tubular frame of their own, and it is they that take the bulk of the weight initially. The details of this chassis are likely to be altered very considerably indeed in Mr. de Havilland's next machine, for he found the present scheme of arranging clumsy and otherwise unsatisfactory. We have already mentioned the additional front wheel and the supplementary side skids that are used.

The Propelling Mechanism.

Details of the engine will be found in a separate article, for which we hope to find room in FLIGHT very shortly; but it must suffice here to say that it weighs about 250 lbs., and that its four $4\frac{1}{2}$ in. bore by $4\frac{3}{4}$ in. stroke cylinders develop about 45-h.p. at 1,500 revs. per min. We are told that it ran with an entirely satisfactory absence of vibration on the "Havilland No. I" and in fact that it, with the whole propeller drive, fully came up to all expectations. In the machine a radiator built up of $\frac{3}{4}$ in. tubes was fixed at an angle of 1 in 6 between and beneath the two parts of the upper main plane, and natural circulation took place through large aluminium pipes coupling it up with the jackets.



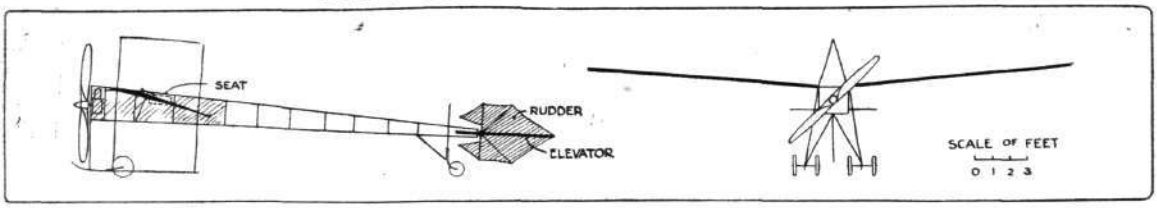
Sketches showing details of the Havilland propeller.

Concerning the propellers, our illustrations show very clearly how four clips are used for securing each of the sheet aluminium blades to the single steel tube which passes unbroken right through the T-shaped hub, and it will readily be understood how these clips permit the angle of the blade with the tube to be adjusted at each of those four points, and thus permits the twist as well as the pitch to be varied. Centrifugal force is guarded against by the thrust washers, and the whole of the back of the blade is neatly covered in with a stiff millboard casing in order to provide a smooth rear surface.

One advantage of this form of propeller construction is that a considerable amount of strength is ensured at the root of each blade where it passes into the hub. This is so not only because the steel tube is continuous from end to end, but also because its central portion is wood filled. On "Havilland No. I" the two-bladed propellers have a diameter of 7 ft. 4 in., and each propeller weighs about 14 lbs.

FLYER SILHOUETTES FROM OLYMPIA.

THE AVIS MONOPLANE.



Leading Particulars of the Avis.

General Dimensions.—Areas—Main planes, 160 sq. ft. ; fixed tail, horizontal, 30 sq. ft., vertical, 25 sq. ft.; elevator, 15 sq. ft.; rudder, 9 sq. ft.

Lengths.—Span, 28 ft. ; chord, 6 ft. 6 ins. ; camber, 4 ins. ; leverage of rudder, 20 ft. ; skid track, 4 ft. ; overall length, 27 ft.

Angles.—Incidence, 9 degrees ; dihedral, 1 in 26.

Materials.—Timber, ash throughout ; fabric, Pegamoid.

Engine.—25-h.p. Anzani.

Propeller.—Howard Wright ; diameter, 6 ft. ; pitch, 2 ft. ; material, Kauri pine.

Weight.—Machine, 280 lbs. ; engine, 150 lbs. ; driver, oil, petrol and water, 200 lbs. ; total flying weight, 630 lbs. ; loading (all weight supported on main planes), 3·9 lbs. per sq. ft.

Speed of Flight.—35 m.p.h.

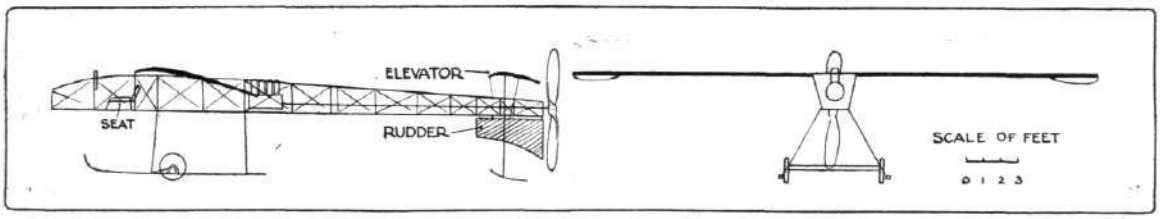
System of Control.—Warping of planes, rudder and elevator.

Price.—£490.

MONOPLANE constucted by Howard Wright for the Scottish Aeroplane Syndicate, and exhibited by their agents, the Aeroplane Supply Co. The machine is of modified Blériot design, and is characterised by the use of a Santos-Dumont type tail. It has an "A" chassis frame and a combination of wheels and skis for the support of the machine.

The engine is carried on a tubular steel framework forming an extension of the main frame, which is made of timber.

THE PETRE MONOPLANE.



Leading Particulars of the Petre Monoplane.

General Dimensions.—Areas—Main planes, 195 sq. ft. ; elevator, 35 sq. ft. ; rudder, 6 sq. ft.

Lengths.—Span, 30 ft. ; chord, 7 ft. ; camber, 3½ ins., situated about 28 ins. from leading edge ; skid track, 5 ft. ; overall length, 29 ft.

Angles.—Incidence, 10 degrees ; dihedral, nil.

Materials.—Timber, ash ; fabric, Dunlop.

Engine.—35-h.p. N.E.C.

Propeller.—Handley Page ; diameter, 7 ft. ; pitch, 3 ft. 4 ins. material, pine.

Weight.—Machine, 385 lbs. ; engine, 155 lbs. ; driver, oil, petrol and water, 200 lbs. ; total flying weight, 720 lbs. ; loading (all weight supported on main planes), 3·7 lbs. per sq. ft.

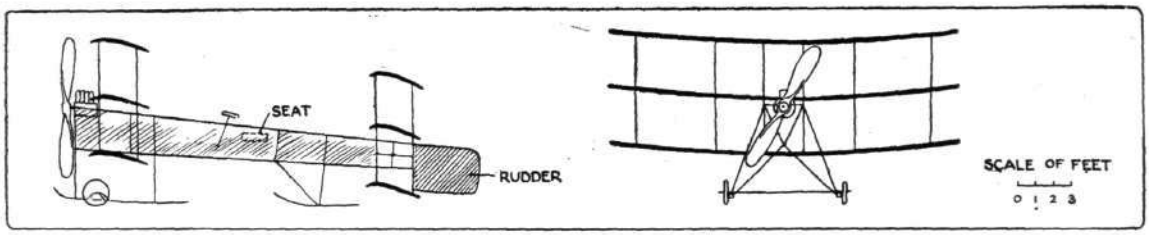
Speed of Flight.—30 m.p.h.

System of control.—Hinged balancing flaps ; rear elevator and rudder.

Price.—£800.

THE Petre monoplane is unique in having the propeller situated at the rear, behind the tail, where it is driven by a long hollow shaft from the engine. The engine is situated just behind the trailing edges of the main wings. The pilot's seat is in front of the leading edges of the main wings, being placed right up in the bows of the frame. The frame construction is also uncommon, being entirely of timber, even to the diagonal ties. The longitudinal spars are of L section and the struts of T section, both members being built up of strip wood. Another important characteristic of this machine is the pivoting of the main wings so that the angle of incidence can be altered in flight. Control is effected by a pair of hinged balancing flaps mounted diagonally on the trailing corners of the main wings by an elevating plane pivoted to a V frame at the rear of the machine and by a rudder mounted under the elevator. Experiments with a machine having the propeller at the rear ought to be extremely instructive. Although at first sight the position is one that looks impracticable, owing to the well-known difficulty of pushing any long object from behind, yet it does not necessarily follow that this arrangement of the propeller is out of the question on aeroplanes any more than it is on ships. It must be remembered that the propeller, being fixed relatively to the frame, is always thrusting through the centre of gravity. If, however, the thrust is applied from without —as, for instance, by a man pushing at the tail of the machine—such a force, although it would be of constant direction, would be variable in respect to the centre of gravity of the machine if the machine swerved from its original path.

THE AVROPLANE.



Leading Particulars of the Avroplane.

General Dimensions.—Areas—Main planes, 246 sq. ft.; elevator, 74½ sq. ft.; rudder, 7 sq. ft.

Lengths.—Span, 26 ft.; chord, 3 ft. 6 ins.; camber, 1⅓ ins.; leverage of rudder, 14 ft.; skid track, 6 ft.; overall length, 24 ft. 6 ins.

Angles.—Incidence, variable from 11 to 4 degrees; dihedral, 1 in 22.

Materials.—Timber, silver spruce struts and spars, ash frame; fabric, Pegamoid.

Engine.—35-h.p. Green.

Propeller.—Roe; diameter, 8 ft.; pitch, 3 ft.; material, birch.

Weight.—Total flying weight, 550 lbs.; loading, 1·7 lbs. per sq. ft.

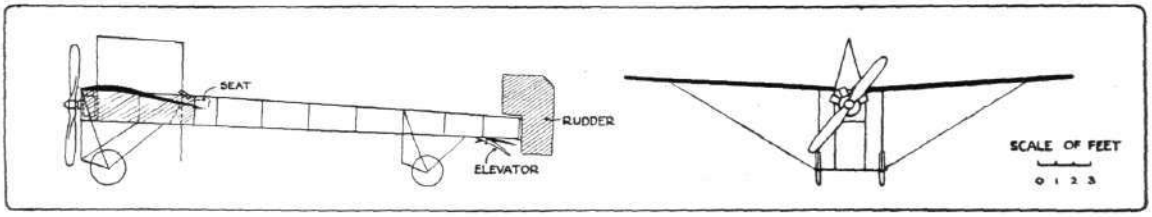
Speed of Flight.—40 m.p.h.

System of Control.—Warping of planes, elevator and rudder.

Price.—£600.

This was the only triplane exhibited, and represented the outcome of much careful work on the part of its designer, A. V. Roe, who has pioneered this type of machine in England. The special feature of its construction is the provision that is made for altering the angle of incidence during flight, the main planes and also the tail, which is a triplane, and carries part of the load, being pivoted and interconnected with an operating mechanism. In a future design we understand that this feature will be extended by making the camber variable as well as the angle of incidence. A strong but light type of "A" chassis frame is employed, and the machine is supported upon a combination of wheels and skis.

THE ORNIS MONOPLANE.



Leading Particulars of the Ornis.

General Dimensions.—Areas—Main planes, 160 sq. ft.; fixed tail, 10 sq. ft.; elevator, 10 sq. ft.; rudder, 5 sq. ft.

Lengths.—Span, 28 ft.; chord, 6 ft.; camber, 3 ins.; leverage of rudder, 25 ft.; skid track, 4 ft. 6 ins.; overall length, 30 ft.

Angle.—Dihedral, 1 in 90.

Materials.—Timber, ash throughout; steel chassis.

Engine.—35-h.p. Lascelles.

Propeller.—Weiss; diameter, 8 ft.; pitch, 3 ft.; material, Kauri pine.

Weight.—Machine, 250 lbs.; engine, 150 lbs. driver, oil, petrol and water, 200 lbs.; total flying weight, 600 lbs.; loading (all weight supported on main planes), 3·8 lbs. per sq. ft.

Speed of Flight.—30 m.p.h.

System of Control.—Warping of planes, rudder and elevator.

Price.—£450.

Monoplane of modified Blériot design, being slightly larger in dimensions and rather lighter in details of construction. Control is effected by an inclined steering wheel, and includes wing warping, elevator, and rudder. The main frame is made of timber braced with diagonal wires, and the chassis is entirely constructed of steel tubes.

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Wright Brothers and Gordon-Bennett Race.

With a view to overcoming any difficulty with regard to the Wrights' patent, the Aero Club of America has entered into an agreement with the Wright Brothers to grant licences to aviators, using other than Wright machines, who wish to take part in the International meeting to be held in the States next October, the chief event of which will be the Gordon-Bennett race. The exact venue for this meeting has not yet been settled. The Wright Brothers have also announced that they are considering the question of giving general licences to organisers of other meetings.

A "Flighty" Equation.

In concluding a recent letter to us, Signor J. del Perojo points out that he receives many aviation papers, especially from France, and although they are five or six times dearer than FLIGHT yet he finds it impossible to come to any other conclusion but that FLIGHT is six times better than all of them together. Assuming that our reader receives only half-a-dozen of the Continental papers, it will be seen that the result of the interesting equation he gives is that FLIGHT is 216 times better value than any of the other papers.

FLIGHTS TO DATE OF ONE HOUR AND OVER.

AN interesting list given below of flights extending over an hour or more has been compiled by a French contemporary, and although these are not in all cases official records, only in a few cases is there any doubt of the duration of the flights.

The name of the Hon. C. S. Rolls is included, but it will be remembered that the longest flight on December 31st was of 55 minutes' duration. Maurice Farman's flight on October 22nd was also five minutes under the hour, whilst the flights of Capt. Burgeat and Gasnier is the first mention we have so far heard.

	H.	M.	S.
Orville Wright (Sept. 9, 1908, Fort Meyer)	1	2	30
Orville Wright (Sept. 10, 1908, Fort Meyer)	1	5	52
Orville Wright (Sept. 11, 1908, Fort Meyer)	1	10	0
Orville Wright (Sept. 12, 1908, Fort Meyer)	1	15	20
Wilbur Wright (Sept. 21, 1908, Auvours)	1	31	25⅘
Wilbur Wright (Sept. 28, 1908, Auvours)	1	7	24⅘
Wilbur Wright (Oct. 6, 1908, Auvours)	1	4	26
*Wilbur Wright (Oct. 10, 1908, Auvours)	1	9	45⅘
Wilbur Wright (Dec. 18, 1908, Auvours)	1	54	53⅘
Wilbur Wright (Dec. 31, 1908, Auvours)	2	20	23⅕
Paul Tissandier (Wright, May 20, 1909, Pau)	1	2	0
Hubert Latham (Antoinette, June 5, 1909, Chalons) ...	1	7	37
Henry Farman (July 20, 1909, Chalons)...	1	23	3⅕
Roger Sommer (Farman, July 22, 1909, Chalons) ...	1	5	30
Roger Sommer (Farman, July 27, 1909, Chalons) ...	1	23	30
*Orville Wright (July 27, 1909, Fort Meyer)	1	12	40
Roger Sommer (Farman, Aug. 1, 1909, Chalons) ...	1	50	30
Roger Sommer (Farman, Aug. 4, 1909, Chalons) ...	2	10	0
Roger Sommer (Farman, Aug. 7, 1909, Chalons) ...	2	27	15
Louis Paulhan (Voisin, Aug. 7, 1909, Malo-les-Bains)...	1	37	0
Louis Paulhan (Voisin, Aug. 25, 1909, Rheims) ...	2	43	4⅘
Hubert Latham (Antoinette, Aug. 26, 1909, Rheims) ...	2	18	9⅘
Hubert Latham (Antoinette, Aug. 26, 1909, Rheims) ...	1	1	51⅘
Comte de Lambert (Wright, Aug. 26, 1909, Rheims) ...	1	52	0
Henry Farman (Aug. 27, 1909, Rheims)	3	4	56⅘
Hubert Latham (Antoinette, Aug. 27, 1909, Rheims) ...	1	45	0
Paul Tissandier (Wright, Aug. 27, 1909, Rheims) ...	1	46	52
Roger Sommer (Farman, Aug. 27, 1909, Rheims) ...	60 kiloms.		
E. Buneau-Varilla (Voisin, Aug. 29, 1909, Rheims) ...	1	56	0
Cody (Sept. 8, 1909, London)	1	3	0
Orville Wright (Sept. 10, 1909, Berlin)	1	2	38
Henri Rougier (Voisin, Sept. 12, 1909, Brescia) ...	1	9	0
Lieut. Calderara (Wright, Sept. 12, 1909, Brescia) ...	1	3	0
Louis Paulhan (Voisin, Sept. 13, 1909, Tournai) ...	1	25	0
*Orville Wright (Sept. 18, 1909, Berlin)	1	35	47
Hubert Latham (Antoinette, Sept. 24, 1909, Berlin) ...	1	2	56
Henri Rougier (Voisin, Sept. 28, 1909, Johannisthal) ...	1	20	0
Henry Farman (Sept. 28, 1909, Johannisthal)	80 kiloms.		
Rougier (Voisin, Sept. 29, 1909, Johannisthal)	1	37	21⅕
Hubert Latham (Antoinette, Sept. 29, 1909, Johannisthal)	1	10	18⅘
Hubert Latham (Antoinette, Sept. 30, 1909)	1	21	0
Henry Farman (Oct. 1, 1909, Johannisthal)	1	31	24
Rougier (Voisin, Oct. 1, 1909, Johannisthal)	2	38	18
Louis Blériot (Oct. 1, 1909, Cologne)	1	4	56
Henry Farman (Oct. 3, 1909, Johannisthal)	2	40	0
Louis Blériot (Oct. 10, 1909, Frankfort)	1	12	0
Baron de Caters (Voisin, Oct. 10, 1909, Frankfort) ...	1	27	0
Henry Farman (Oct. 20, 1909, Blackpool)	1	32	16⅘
Maurice Farman (Oct. 22, 1909, Buc)	1	—	
Rougier (Voisin, Oct. 28, 1909, Antwerp)	1	3	8
Capt. Engelhardt (Oct. 29, 1909, Bornstadt)	1	6	30
Louis Paulhan (Farman, Oct. 30, 1909, Brooklands) ...	2	49	20
*Henry Farman (Nov. 1, 1909, Chalons)	1	17	0
Henry Farman (Nov. 3, 1909, Chalons)	4	17	53
Capt. Engelhardt (Wright, Nov. 5, 1909)	1	50	0
Chateau (Voisin, Dec. 12, 1909, Chalons)	1	1	53
J. de Lesseps (Blériot, Dec. 16, 1909, Issy)	1	30	28
Mortimer-Singer (Farman, Dec. 20, 1909, Chalons) ...	1	1	23
Jacques Balsan (Blériot, Dec. 27, 1909, Pau)	1	11	0
Hubert Latham (Antoinette, Dec. 30, 1909, Chalons)...	1	20	0
Leon Delagrange (Blériot, Dec. 30, 1909, Juvisy) ...	2	32	0
Hubert Latham (Antoinette, Dec. 31, 1909, Chalons)...	1	22	0
C. S. Rolls (Wright, Dec. 31, 1909, London)	1	4	0
Henry Farman (Dec. 31, 1909, Chalons)	1	10	0
Van den Born (Henry Farman, Jan. 5, 1910, Bourg) ...	1	16	0
Curtiss (Jan. 11, 1910, Los Angeles)	1	—	
Olieslaegers (Blériot, Jan. 16, 1910, Oran)	1	5	12⅘
Louis Paulhan (Henry Farman, Jan. 18, 1910, Los Angeles)	1	57	27
Louis Paulhan (Henry Farman, Jan. 21, 1910, Los Angeles)	1	49	40
*Van den Born (Henry Farman, Jan. 31, 1910, Chalons)	1	48	50
*Effimoff (Henry Farman, Jan. 31, 1910, Chalons) ...	1	48	3
Rougier (Voisin, Feb. 6, 1910, Heliopolis)	65 kiloms.		
Metrot (Voisin, Feb. 9, 1910, Heliopolis)	85 kiloms.		
Rougier (Voisin, Feb. 11, 1910, Heliopolis)	48 kiloms.		
Geo. Chavez (Henry Farman, Feb. 28, 1910, Chalons)	1	47	0
Capt. Burgeat (Antoinette, Pau)	1	(?)	
Lieut. Camermann (Henry Farman, Mar. 2, Chalons)...	1	5	0
Maurice Farman (Mar. 2, 1910, Buc)	1	0	0
Crochon (Henry Farman, Mar. 6, 1910, Chalons) ...	1	1	0
†Henry Farman (Mar. 5, 1910, Chalons)	1	2	25
Gaudart (Voisin, Mar. 6, 1910, Juvisy)	1	10	0
Molon (Blériot, Mar. 11, 1910, Le Havre)	1	24	0
Molon (Blériot, Mar. 17, 1910, Le Havre)	1	4	0
Popoff (Wright, Mar. 21, 1910, Cannes)	1	33	0
Gasnier (Wright, Mar. 24, 1910, Pau)...	1	(?)	
Grahame-White (Farman, March 27, 1910, Mourmelon)	1	5	0
Crochon (Farman, March 27, 1910, Cannes)	1	9	29
Frey (Farman, March 27, 1910, Cannes)	1	9	2⅘
Blériot (April 2, 1910, Pau)	1	15	0
*D. Kinet (Farman, April 2, 1910, Mourmelon) ...	1	2	30
Gibbs (Farman, April 3, 1910, Mourmelon)	1	12	0
Dubonnet (Tellier, April 3, 1910, Juvisy-Orleans) ...	1	50	0
Frey (Farman, April 3, 1910, Cannes)	1	2	58
Sommer (April 4, 1910, Mouzon)...	1	6	0
Capt. Dickson (Farman, April 5, 1910, Mourmelon) ...	1	33	0
Capt. Marconnet (Farman, April 6, 1910, Mourmelon)	1	10	0
†D. Kinet (Farman, April 8, 1910, Chalons)	2	19	15⅘
Jeannin (Farman, April 11, 1910, Johannisthal) ...	2	1	55

* With passenger. † With 2 passengers.

The following is the chronological order of the respective aviators reaching the full hour's flight:—

1, Orville Wright; 2, Wilbur Wright; 3, Paul Tissandier; 4, Hubert Latham; 5, Henry Farman; 6, Roger Sommer; 7, Louis Paulhan; 8, Comte de Lambert; 9, Buneau-Varilla; 10, Cody; 11, Henri Rougier; 12, Lieut. Calderara; 13, Louis Blériot; 14, Baron de Caters; 15, Maurice Farman; 16, Capt. Engelhardt; 17, Chateau; 18, J. de Lesseps; 19, Mortimer-Singer; 20, Jacques Balsan; 21, Léon Delagrange; 22, Van den Born; 23, Curtiss; 24, Olieslaegers; 25, Effimoff; 26, Métrot; 27, Geo. Chavez; 28, Capt. Burgeat; 29, Lieut. Camermann; 30, Crochon; 31, Gaudart; 32, Molon; 33, Popoff; 34, Gasnier; 35, Grahame-White; 36, Crochon; 37, Frey; 38, D. Kinet; 39, Gibbs; 40, Dubonnet; 41, Dickson; 42, Jeannin.

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British Army Airship out Again.

In spite of most unfavourable weather the new Army "Dirigible No. 2" made, on Friday of last week, her best voyage so far. A light rain was drizzling in the afternoon when the airship was brought out of her shed and Col. J. E. Capper, Lieut. Waterlow and Mr. Green climbed into the hull, but they determined to go on with the trial. After carrying out a series of turning movements over Farnborough Common, Col. Capper headed his craft into a north-west breeze and kept on at a speed of just under 20 miles an hour until he had left Bagshot behind. Then the vessel was turned round and the return journey was made at a speed of very nearly 40 miles an hour. Farnborough Common was again reached without mishap, and after a few more experiments with the steering gear, the airship was safely housed after a trip lasting 70 mins.

M. Blériot in England.

As was announced in our last issue, M. Louis Blériot, accompanied by Madame Blériot, was present at the ceremony of unveiling the Royal Aero Club memorial at Dover, which marks the spot where M. Blériot landed after his histori: cross-Channel flight. In performing the ceremony, Lord Brassey, Lord Warden of the Cinque Ports, said they were met to commemorate a great deed of heroism and a feat of consummate skill. They congratulated M. Blériot on his glorious success. His splendid feat had given an impetus to the art of aviation. M. Blériot replied briefly in French, thanking Lord Brassey, and took the opportunity of presenting Mr. Harold Perrin, Secretary of the Royal Aero Club, with a silver cigar-case, as a memento of the cross-Channel flight, and in recognition of the helpful assistance given to M. Blériot on his various visits to this country.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A meeting of the Committee was held on Tuesday, the 12th inst., when there were present:—Mr. Roger W. Wallace, K.C., in the chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Prof. A. K. Huntington, Mr. C. F. Pollock, Mr. Stanley Spooner, and Joint secretaries, Capt. E. Claremont, R.N., and Harold E. Perrin.

New Members.—The following new members were elected:—

Mrs. Alexander Anderson.	Alexander Edward Johnston.
Arthur Cornelius Baker.	Arthur Pedler.
John Henry Paulet Daman.	Capt. Francis Peiniger, R.A.
G. Ward Grazebrook.	Capt. Chas. John Tanner, R.G.A.

Bournemouth Aviation Meeting.

The Royal Aero Club, in conjunction with the Royal Automobile Club, have arranged to take the Hotel Burlington, at Boscombe, for their respective members during the aviation week. It is a first-class hotel, standing in 7½ acres of ground, which extends almost to the sea. The accommodation has been taken from July 11th to 16th, inclusive. As there is a large demand for rooms, members are requested to make early application to the Secretaries of either Club.

Aeroplane *v.* Motor Boat.

The Motor Yacht Club have sent in a challenge to the Royal Aero Club for a race between a motor boat and an aeroplane, to take place during the Bournemouth Aviation Meeting. The proposed course will probably be round the Needles and back. The details will shortly be fixed up between the respective clubs.

Gordon-Bennett Aviation Cup.

The contest for the International aviation trophy, offered by Mr. James Gordon-Bennett, will take place on October 22nd next in America. The Royal Aero Club will select the three competitors to represent this country from the following:—

Hon. Maurice Egerton.	Hon. C. S. Rolls.
Mr. J. T. C. Moore-Brabazon.	Mr. A. M. Singer.

Balloon Races at Hurlingham.

The following Races will take place at Hurlingham:—

May 28th	...	Hare and Hounds Race. Trophy presented by Hon. C. S. Rolls.
June 22nd	...	Hedges Butler Challenge Cup Race.
July 2nd	...	Point to Point Race for the Mortimer Singer Cup.
July 23rd	...	Perimeter Race. Cup presented by Mr. Griffith Brewer.

Official Timekeepers.

The following Official Timekeepers have been appointed by the Royal Aero Club:—

Mr. F. T. Bidlake.	Mr. A. Fattorini.
Mr. J. H. Burley.	Mr. C. P. Glazebrook.
Mr. A. Deacon.	Mr. H. Hewitt Griffin.
Mr. T. D. Dutton.	Mr. J. B. Hyland.
Mr. A. V. Ebblewhite.	Mr. F. Straight.

Aviator's Certificate.

The Committee at their meeting on Tuesday last, granted an Aviator's Certificate to Mr. Cecil Grace.

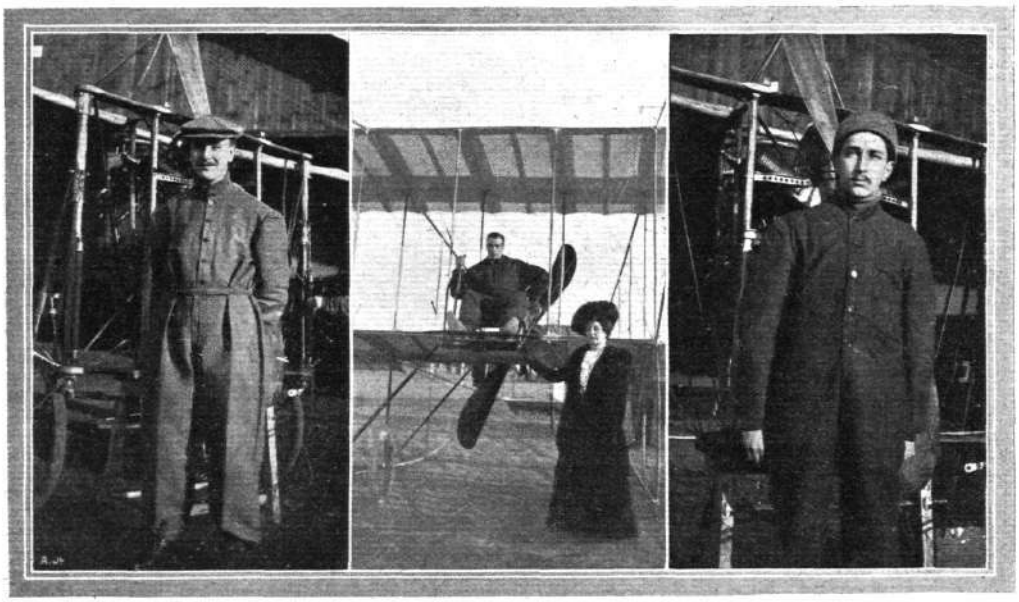
Shellbeach Flying Ground.

The Royal Aero Club have made arrangements with the owner to make large improvements in the surface of the flying grounds at Shellbeach and approaches, and the work will be proceeded with at once. Members wishing to erect sheds there are requested to make application to the Secretary.

Aviation Lantern Slides.

The Royal Aero Club have now acquired a large collection of lantern slides dealing with aviation, and members can hire these at a fee of £1 1*s.* for a period not exceeding three days. They include all the latest machines and pictures taken at aviation meetings in England and abroad. Application for hire should be made to the secretary.

HAROLD E. PERRIN,
166, Piccadilly. Secretary.



Mr. C. Grahame-White, after his 65 mins. flight on March 28th, and a couple of his pupils, Mr. Armstrong Drexel (left) and Mr. Charles Hubert (right). In the centre picture Mr. Grahame-White's mother, who has flown with her son, is standing in front of the Henry Farman machine.

PROGRESS OF FLIGHT ABOUT THE COUNTRY.

(NOTE.—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary. We would ask Club Secretaries in future to see that the notes regarding their Clubs reach the Editor of FLIGHT, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.)

Hampshire Aero Club (48, PALMERSTON ROAD, SOUTHSEA).

WITH the permission of the War Department a site has been selected near Fort Grange, Gosport, for experiments in aeronautical science.

Practical demonstrations of the lifting power of the air were carried out under the direction of the President, Mr. Patrick Y. Alexander, with a glider of his own construction, and were watched with interest by the public, including many of the garrison.

Several members of the club made their first flight and seemed to enjoy the experience. The experiments were entirely satisfactory. A special course has been laid out and is being levelled sufficiently to admit of a fair start for aviators.

At the meeting to-day, Saturday, the 16th inst., it is hoped that some further developments may be seen.

Mr. Day, a member of the Hampshire Aero Club and a most expert mechanician, has constructed a monoplane which will compare favourably with any that were exhibited at Olympia. Lieutenants Porte and Pirie, R.N., also possess machines with motors and they will probably lead the way in practical aviation in the South of England.

Northumberland Ae.C. (ROYAL TURK'S HEAD, NEW.-ON-TYNE).

THE Committee announce that they have arranged with Mr. Richard Thornton, Resident-Director of the Newcastle Empire Theatre, for Baldon Racecourse as a prospective flying-ground for the club.

Aeroplane sheds are already being erected, and certain obstacles removed, and it is confidently hoped that in the course of three or four weeks the ground will be ready for trial flights. The area of the ground is nearly 300 acres, the course being circular and about a mile and a half in length.

It is the intention of the club to hold a series of trials and gliding demonstrations during the coming summer, at which the public will be admitted. The following members possess power-driven machines: Mr. Geo. W. Parkinson, who has flown 250 yds. on his Blériot XI; Mr. J. G. Nyborg, of Elswick, who has built a monoplane to his own design; Mr. Oswald Elsworth, whose machine is a 25-h.p. Blériot-type monoplane; and Capt. H. S. Bell, D.S.O., who has bought a glider, all of which are likely to be seen at the aviation ground very shortly.

A glider is to be purchased for the use of members, and the building or purchasing of other flying machines is in contemplation by individual members. The club now numbers nearly 200 members, and has a well-furnished club room at the Royal Turk's Head Hotel, Newcastle, in which the latest aviation books and papers are to be found.

Sheffield and District Aero Club (36, COLVER ROAD).

AN extraordinary meeting was held on the 6th inst., the object being to discuss the question of amalgamation of the club with a proposed club in Sheffield.

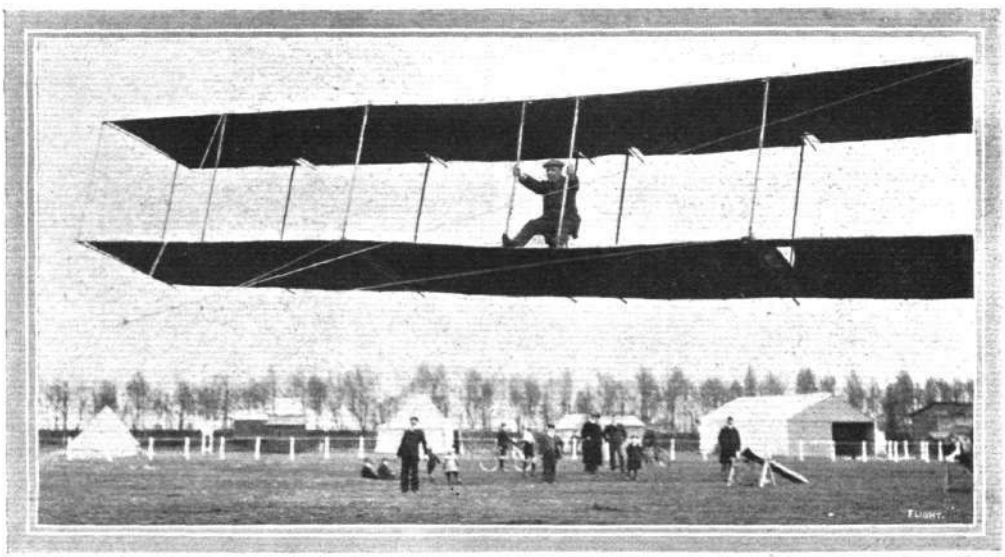
Four delegates, consisting of Messrs. Kavanagh, Wightman, Pashley and C. E. Richardson, had previously met representatives of the proposed club, and arrived at a mutual arrangement to join forces. After the club delegates had expressed their opinions to the members, the chairman, Mr. Kavanagh, explained the position, as did the secretary, who also read a full report of the delegates' meeting. The conditions of amalgamation as drawn up by the respective parties' representatives, came in for much discussion, but finally, on a vote being taken, it was carried that the conditions be accepted. The title of the club will remain the same, namely, the Sheffield and District Aero Club, and the club rules and badges will be retained. Members are requested by the secretary to note that a general meeting will be held at the Aero Works, 26, Paradise Street, on Wednesday, the 20th inst., at 8 p.m. A full attendance is most desirable, and all interested persons are invited to this meeting.

S.W. Aeronautical Soc. (51, ST. LEONARD'S ROAD, EAST SHEEN).

THE first annual dinner took place last Saturday evening, the 9th inst., at the Boulogne Restaurant, Gerrard Street, W., followed by a grand smoking concert, to the programme of which Messrs. Alan Stainer, J. F. Smith, Harry Collman, Fred Curtis, Fred Gregory, Wilson Martell, Misses Mary Paterson, Julia Baily, and Alice Braunstein contributed.

There was a large attendance, and the balance-sheet was read by the chairman, J. L. Warsop, after which Mr. A. J. Fransella, the Secretary, outlined the splendid progress of the club, which now owns premises, and a monoplane ready for flight.

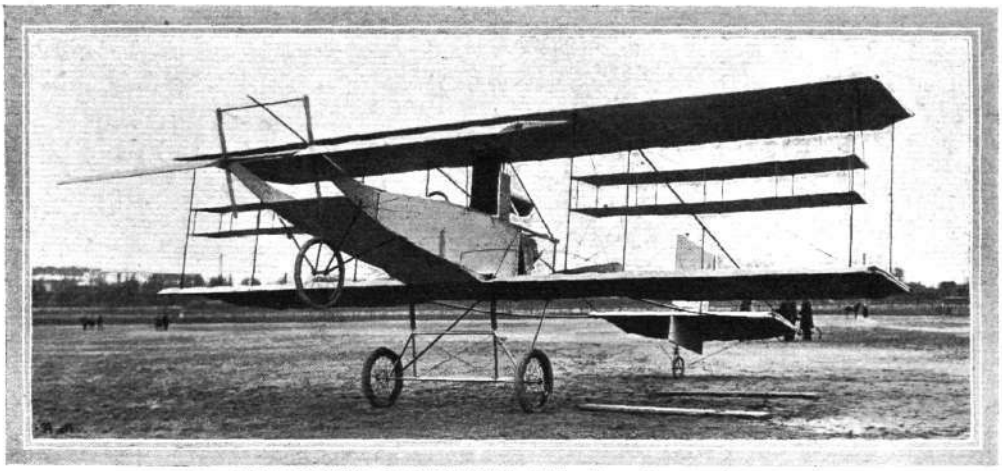
The next meeting will be at Ship Hotel, Hammersmith, on April 24th, 1910, at 6 p.m. sharp, while a model competition will be held on April 30th, 1910.



HAMPSHIRE AERO CLUB.—Although only recently founded, this Club, of which Mr. Patrick Y. Alexander is the President, is making considerable progress in practical flight, having man-carrying gliders already in operation, with several motor-driven flyers in hand. On the 9th inst. the opening meet of the Club's practice field at Fort Grange, Fareham, took place, this being the occasion of our photograph above, in which are seen the Club's camp and aeroplane shed, whilst an enthusiastic naval officer is taking his turn in the glider, his co-workers (out of the picture) acting as "motors" against the wind. Capt. F. W. Marriott is the energetic Secretary of the Club.

FLIGHT

NEW RACING VOISIN BIPLANE.



NEW VOISIN RACING BIPLANE.—View from in front.

On this page we reproduce a couple of photographs which convey a very good idea of the new Voisin machine which has just been built for Rougier, and on which he hopes to win some of the chief prizes at the various big meetings during the year. It will be noticed that one striking departure from the characteristic of the Voisin is in the tail, which is now similar to that adopted by Sommer and Farman. Side curtains between the main planes have also been dispensed with, and transverse stability is controlled by long biplane ailerons between the main planes. The arrangement of the prow and elevating plane has also undergone slight modification. The span of the main planes is 9 metres, and the total lifting surface of the machine 33 square metres, while the overall length is 9 metres. The weight, with fuel, &c., on board, is 350 kilogs. A single two-bladed Voisin propeller, of 2 metres diameter, is fitted, and driven at a speed of 1,200 revs. per min. by an 8-cylinder 50-h.p. water-cooled E.N.V. motor.

Side view of the new Voisin biplane, racing type.

Harvard Aeronautical Society.

Harvard University has an Aeronautical Society that has been in existence since November of last year, and has attained an active membership of 350 in the course of its first three months' campaign. Judging from the booklet that has been issued, the institution is an extremely go-ahead concern, for, besides making arrangements for lectures and cinematograph exhibitions, its members have constructed a glider, and are already at work upon a full-sized flying machine known as aeroplane "Harvard I." It is one of the privileges of members of the Society that they will have the right to use the patented ideas embodied in this machine so long as they do not construct their flyers for sale.

It may be mentioned as a matter of some interest that the leading feature of aeroplane "Harvard I" is a swivelling power plant so arranged that the axis of the propeller-shaft can be inclined at any angle to the chord of the planes. Those who have designed this machine consider that the system offers a better solution of the problem of variable speed than that adopted by A. V. Roe, who uses swivelling planes.

Arrangements have been made for the affiliation of the Society with the Aero Club of America so as to secure all possible privileges in the matter of competitions. The Society is open to any present or former member of the Harvard University. The fees are 5 dollars entrance and 2 dollars annual subscription. Graduate members, consisting of those who have ceased to keep their names on the University register, are admitted on payment of 10 dollars and an annual subscription of 5 dollars.

We should like to specially call the attention of Oxford and Cambridge to the above progressive movement.

AVIATION NEWS OF THE WEEK.

Mr. Cecil Grace at Eastchurch.

HAVING had the damage to his Short-Wright machine, sustained in the fall a fortnight ago, repaired, Mr. Cecil Grace was again flying on it at Eastchurch on Monday, when he completed a circular flight of a mile, passing over sheds, hedges and ditches. A 50-h.p. Gnome engine is now fitted to the machine. Mr. Grace has been granted the R.Ae.C. pilot's certificate.

A Blériot at Huntingdon.

ON Saturday evening Mr. J. Radley made a first trial with a Blériot monoplane on the Portholme aerodrome at Huntingdon, when his best performance was 150 yards at a height of 10 ft. On Monday morning Mr. Radley was at work early, and twice flew across the meadow, a distance of 1,000 yards, at a height of 25 ft., while in the evening the aviator made five similar flights with the object of practising turning movements. The following day Mr. Radley twice flew for a mile and a quarter.

Captain Dickson Flies 1 hr. 33 mins.

ONE of the most promising flyers at the Henry Farman School is Capt. Dickson, who on the 5th inst. at Mourmelon, flew for 1 hr. 33 mins., while on the 8th inst. he was flying at an altitude of 150 metres and landed *en voi plane* from that height. A similar flight was made on the 11th inst., when Laborie, a pupil of Capt. Dickson, also made a satisfactory initial flight of 20 mins.

Mr. Claude Grahame-White's Further Progress.

ONE of the most promising British "bird-men" is certainly Mr. Grahame-White, who has not been content, in view of his future work in connection with his British School for Flyers, to master one machine only. First attaining proficiency at Pau on the Blériot monoplane, he has been still more rapid in acquiring further skill with a Henry Farman biplane at Mourmelon. In addition to his work already recorded in FLIGHT, he has since been making some daring flights on the Farman, taking up passengers as an ordinary occurrence. Already he has in France several pupils in training, two of whose portraits appear in this week's issue, and upon his return to England there is little doubt he will have his hands more than full in teaching the host of men who are waiting anxiously to acquire the new art under reasonable conditions. Mr. Grahame-White has serious thoughts of trying the London to Manchester flight for the *Daily Mail* £10,000 prize, and has accordingly made formal entry for that event.

Doings at Mourmelon.

APART from the flights of Kinet and Capt. Dickson, which we have referred to elsewhere, quite a number of interesting flights have been made at Chalons Camp. At the Henry Farman school some fifteen pupils have been in the air almost daily, while the Voisin, Blériot and Antoinette schools have each had their quota of budding flyers at work, including several ladies.

At the Farman School Lieut. Cammerman, having mastered his machine, has been giving lessons to Capts. Madiot and Marconnet and Lieut. Sido. Each day Osmond has made fairly lengthy flights, and on the 8th inst. he covered 15 kiloms., carrying about 85 kilogs. of ballast. On the 10th he flew for 60 kiloms., and on the following day carried a passenger during a trip lasting 18 mins. Mr. Claude Grahame-White visited Chalons on the 10th and took up several of his pupils for trips on his Henry Farman machine, while during the same afternoon Lieut. Gibbs flew a distance of 20 kiloms.

Remarkable progress has been made by one of the pupils—Wienziers—of the Antoinette School, and at his sixth lesson, on the 7th inst., he flew for 35 mins. at a height of 80 metres. Latham was at Chalons on the following day, and made a couple of short flights.

Lesseps, on the Saulnier monoplane, which has a Gnome engine, flew for 9 mins. on the 7th inst., while, on the previous day, Leon Morane, on a Blériot monoplane, was up for 45 mins.

Kinet's Record Passenger Flight.

AFTER several practice spins last week, the best being of 1 hr. 2 mins. duration, Daniel Kinet set out on the 8th to beat the world's passenger record, and, accompanied by M. Lebedeff, he flew for 2h. 19m. 15⅘s., thus bettering by half an hour Van den Born's old record of 1h. 48m. 50s. Kinet was using his Henry Farman machine, and kept at a fairly constant altitude of about 30 metres. The distance covered was about 152 kiloms.

Maurice Farman Carrying Passengers.

ON Monday, Mr. Maurice Farman made a series of flights at Buc, each trip being for a distance of about 10 kiloms. A passenger was taken each time, and those who were accorded this privilege were Mdme. Stouvenaut and MM. G. Kellner Merville and Stouvenaut.

Guffroy on the R.E.P. at Buc.

ALTHOUGH nothing has been heard of the R.E.P. monoplane for some time, a good deal of experimenting has been quietly carried on by Maurice Guffroy. A new machine has been built, and two flights of a quarter of an hour each were made on Sunday. A third flight of longer duration was made, and was ended by the machine falling from a height of 60 metres, owing to the motor suddenly stopping. Luckily M. Guffroy escaped with a nasty cut on the forehead, but the machine was considerably damaged.

Leblanc and others at Pau.

MOUNTED on a new Blériot machine, Leblanc flew at Pau for an hour and a quarter on Monday, and only stopped owing to the petrol giving out. The Grahame-White school at Pau was closed last week, all the different machines being packed for despatch to England, for the opening of the new school near London. Mr. MacArdle left Pau, too, on the 8th inst., after carrying out the necessary flights to qualify for his pilote-aviateur's certificate.

Anzani at Issy.

ON the 7th inst. Anzani was trying his monoplane at Issy, and at one time flew eight rounds of the parade ground, while at a subsequent attempt he completed six circuits. On Saturday Tranchant, on a Blériot, flew for 22 mins.

Doings at Juvisy.

ON the 6th inst. Ladougne, on the Goupil machine, flew round the course several times, while on the following day Koechlin made several good short flights on his monoplane.

Sommer and his Pupils at Mouzon.

ALMOST every day last week Sommer made flights with passengers, and Amerigo carried out some experiments in weight lifting on Saturday, flying for 43 mins. with 100 kilogs. of ballast on board. Later he made two short flights with 220 kilogs. of ballast. Bouvier has also made several flights with passengers, and on Monday commenced to instruct Mdlle. Dutrieux, who has ordered a Sommer biplane.

Mechanics' Prize for Mechanics.

SOME time ago, the mechanics belonging to the Aeronantique Club of France offered a prize of 500 francs, to be given to the mechanic of the pilot who first flew for 100 kiloms. across country. This prize has now been awarded to MM. Joly, Yvon, and Pamard, who looked after the 35-h.p. Panhard fitted to the Tellier monoplane on which M. Dubonnet recently made his wonderful cross-country trip.

Ae.C.F. Doings.

AT the last meeting of the Aviation Committee of the Aero Club of France, Mr. P. Soreau was nominated as Chairman, and M. Blériot, Commandant Bouttiaux, and M. Esnault-Pelterie as Vice-Chairman, with M. Paul Rosseau as Secretary.

It was decided to grant pilote-aviateurs' certificates to Capt. Burgeat, A. Crochon, F. Deletang, G. P. Kuller, Lieut. Bellenger. It was also decided to recommend the Italian Club to grant a certificate to Cattaneo, who had qualified.

In commemoration of his cross-country flight from Juvisy to La Ferté St. Aubin, it has been decided to award a silver gilt medal to M. Dubonnet.

Foreign Spies at Chalons.

AS a consequence of the rumours which reached the ears of the French Minister of War that under the guise of learning to fly, various foreigners have been straying over the military quarters and taking notes, new regulations, as we foreshadowed, have been promulgated for the use of the parade-ground by aviators. Henceforth, each aviator, and every one of his pupils, must obtain a permit, on which will be mounted a photograph of the holder, from the military authorities, before he will be allowed to fly, and even then he must be careful not to fly over certain parts of the camp. Moreover, flying between the hours of 8 a.m. and 7.30 p.m. is strictly forbidden.

Aviators in the French Army.

AT the suggestion of some French aeronautical societies, the French military authorities are arranging that those conscripts who are members of such societies shall, when called to the colours, be enrolled in the aviation sections or ballooning battalions. Before doing so, however, they will have to undergo an examination to show that they are not without experience or training in the work to which they wish to be attached.

An English Entrant for Lyons.

Among the entrants for the International meeting to be held at Lyons from May 7th to 15th, is Mr. Harding, who has recently been flying at Huntingdon racecourse. He has entered a monoplane fitted with a J.A.P. engine. The other entrants so far are Metrot (Voisin), Van den Born (Henry Farman), Latham (Antoinette), Molon (Blériot), Legagneux (Sommer), Dubonnet (Tellier), Paulhan (Henry Farman), and it is also almost certain that Rougier will enter his new racing Voisin.

A Two Hours' Flight at Berlin.

A new German record for duration was set up on Monday when Jeannin, on a Henry Farman machine, flew 2h. 1m. 55s., during which time he circled the Johannisthal flying ground 44 times, keeping generally at a height of about 15 metres.

Flying Meetings in Germany.

In addition to the International meeting which is to be held at Johannisthal from May 10th to 16th, two other meetings have been arranged to be held there, whilst two are to be held at Munich and one each at Dantzig and Leipzig. The first entry for Johannisthal was a Sommer biplane by Amerigo, while Voisin machines have been entered by Baron de Caters and Baroness de la Roche.

Godard Flies 50 kiloms. at Barcelona.

The inhabitants of Barcelona were treated to an exhilarating experience of the 10th inst., when Godard flew over the town and harbour and twice circled above the monument of Christopher Columbus. Eye-witnesses describe the flight as being as impressive as that of Count Lambert's over Paris. Altogether about 50 kiloms. were covered in 55 mins.

A Blériot Week for Seville.

A week of flying on Blériot machines has been arranged by M. Borel to take place at Seville from May 1st to 8th, when the performers will be M. Blériot, J. de Lesseps, Mr. Claude Grahame-White, and M. Barrier.

A Monoplane at Baddeck.

In addition to the tetra-hedral aeroplane and the Baddeck biplane referred to last week, a monoplane is now undergoing tests at Dr. Graham Bell's laboratory at Baddeck, N.S. This is the invention of Mr. Hubbard, and resembles in general features the cross-Channel type of Blériot machine. Although the ice over the Bras d'Or Lake was in a rotten condition, nine flights were made, during which the designer was accompanied by Mr. Gardiner Greene. None of them exceeded half-a-mile in extent, and were mostly made at an altitude of between 10 ft. and 15 ft.

Mr. H. S. Maxim has a Fall.

While trying his new aeroplane at New York on the 4th inst., Mr. H. Stevens Maxim fell from a height of about 30 ft., owing to something going wrong with the machinery. The machine, of course, was badly damaged and Mr. Maxim escaped with several bruises and a bad shaking.

An Hungarian Monoplane.

In the two accompanying photographs is seen a monoplane which has just been constructed at Budapest by an engineer, Aladar Zeelyi. The frame is constructed of spruce and steel-tubing, braced in the ordinary way by steel wires. The two main-planes fit into sockets in the main frame at a small dihedral angle. They have a span of 20 ft. and a chord of 6 ft., while the total lifting surface of the machine is 130 sq. ft., and the elevator has an area of 21·5 sq. ft. A two-bladed Chauvière tractor-screw, 6 ft. in diameter, is driven direct by a 30-h.p. Darracq water-cooled motor; and the novel arrangement of the radiator will be noticed in the photographs. The total length of the machine is 23 ft., and it weighs 340 lbs., or 475 lbs. with the pilot on board.

Airship News.

"Clement-Bayard" Airship Launched.

The prospects of seeing the "Clement-Bayard" airship are getting near now, as, after the many difficulties which have had to be encountered, the dirigible was taken out of her shed at Compiegne on Tuesday for her initial tests. No free flights were made, M. Clement deeming it prudent to thoroughly test the elevating planes and propellers while the airship was moored at the end of some hundred feet of rope. Everything seemed to work perfectly, however, and it is hoped that lengthy trials will soon be undertaken prior to its sailing for London.

"Ville de Pau" in Service.

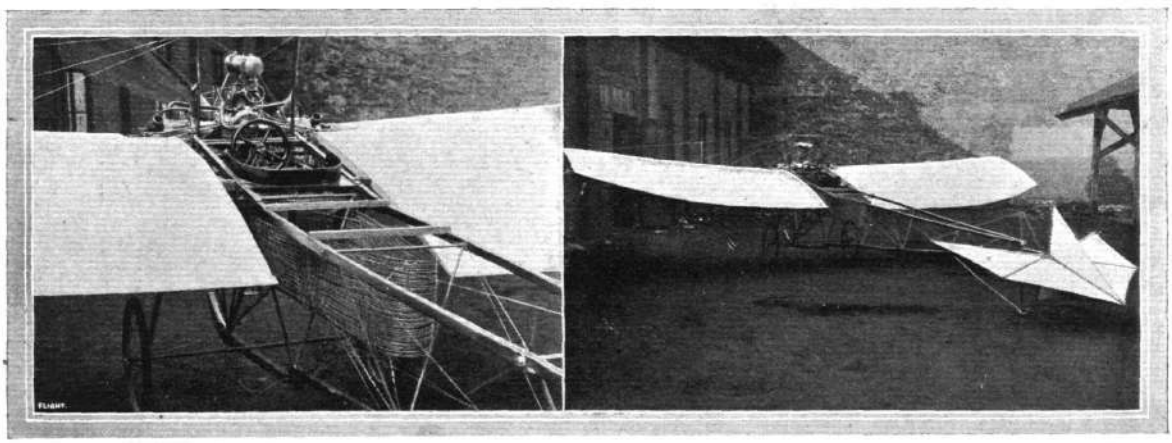
The Astra dirigible "Ville de Pau" made its first regular trip with paying passengers on the 6th inst., and since then it has been out daily when the weather has been fine enough. The fare charged for a trip lasting from thirty minutes to an hour is 100 fs.

"Parseval III" at Cologne.

Piloted by Lieut. Stelling, who was accompanied by eleven passengers, "Parseval III" made its first ascent at Cologne in connection with the German airship manœuvres on the 7th inst. A strong wind was blowing, and the difficulties were added to by a thick fog, but a voyage lasting nearly an hour was successfully made, during which the vessel rose to a height of 1,300 metres.

"Siemens-Schuckert" Nearly Ready.

The new German dirigible, "Siemens-Schuckert," is now practically ready for her maiden voyage, and last week a number of prominent German military officers, including General von Lyncker and Commandants Gross and Sperling, paid a visit to the garage at Biesdorf, near Berlin, to see the motors, &c., tested. The operation of the elevating planes was explained by Herr Knell, Capt. von Krogh, and the engineer Dietznis. It will be remembered that this vessel will have three boats, each containing a 200-h.p. motor driving two propellers.



A new monoplane built in Hungary, built by a member of the newly-formed Aero Club of Hungary at Budapest.

CORRESPONDENCE.

**** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

Correspondents asking questions relating to articles which they have read in FLIGHT, would much facilitate our work of reference by giving the number of the letter.

NOTE.—*Owing to the great mass of valuable and interesting correspondence which we receive, immediate publication is impossible, but each letter will appear practically in sequence and at the earliest possible moment.*

TO WATERPROOF CALICO.

[455] A misprint occurred in the last paragraph of Miss Bland's letter, No. 441, which appeared on page 280. The amount of bi-carbonate of potash should read 3 grammes, not 3 ozs. As it was clearly stated in the first instance that all dimensions were in metric measurements the misprint will have been obvious to our readers.

THE MULLINER MONOPLANE.

[456] I notice in the current issue of FLIGHT, under the heading of "Flyer Silhouettes from Olympia," that you have been kind enough to mention the Mulliner monoplane.

There is, however, one remark that naturally calls for an explanation from myself, inasmuch as you state that "there are some parts, however, that we shall expect to see strengthened within a short while of this machine commencing its practical trials."

I think you will agree with me that the machine, having been shown in an incomplete state, was very liable to convey an erroneous impression in the matter of its strength. The monoplane exhibited is admittedly a light machine, one of the lightest that have been constructed, but I believe that its strength will be adequate for its purpose.

Practical trials will, of course, show up any weak spots that exist, but these will, in all probability, not take place before Whitsun.

Northampton. GORDON STEWART.

A CLERGYMAN'S MODEL.

[457] I have been an interested reader of FLIGHT almost from its commencement, and equally as interested in the rapid progress of aviation. Although I have never yet seen either a model or a full-sized machine, I herewith send photos of a model of my own make which will fly.

	ins.		ins.
Length of main plane ...	36	Width of tail at back ...	12
Width	9	Length of elevator ...	6
Length over all	42	Length of rudder	6
Length of tail and back fin	16	Propeller of the Beedle type	7

The fabric is Nainsook. It is driven by an elastic motor of my own make; ball bearings, and geared 6 to 1. Two yards of $\frac{3}{16}$ elastic is used for motor, winding by a ratchet at back of frame. The frame is V-shaped, made of Kauri pine. The full weight is 18 ozs. I want (if possible) you to publish this in FLIGHT, as I am anxious to arouse the interest in this place of the youths in aviation. Thanking you in anticipation, and also for your most interesting paper.

Nailsworth. (Rev.) J. W. TIMSON.

MODELS AND TOYS.

[458] I notice in your interesting article on the models at Olympia, that you describe G. P. B. Smith's and M. Jones's models as toy biplanes.

With regard to the first model, you state that it is "a serious design embodying a tangible theory."

In the interest of model makers, I do not think that serious attempts at model construction should ever be classed as toys, even if they are made commercially.

Both models were awarded the bronze medals of the Motor Union in the class for model aeroplanes, and I am under the impression that there was no class for toy aeroplanes.

I have no doubt this is a misprint, and hope you will give prominence to the fact.

Blackheath. A. C. HORTH.

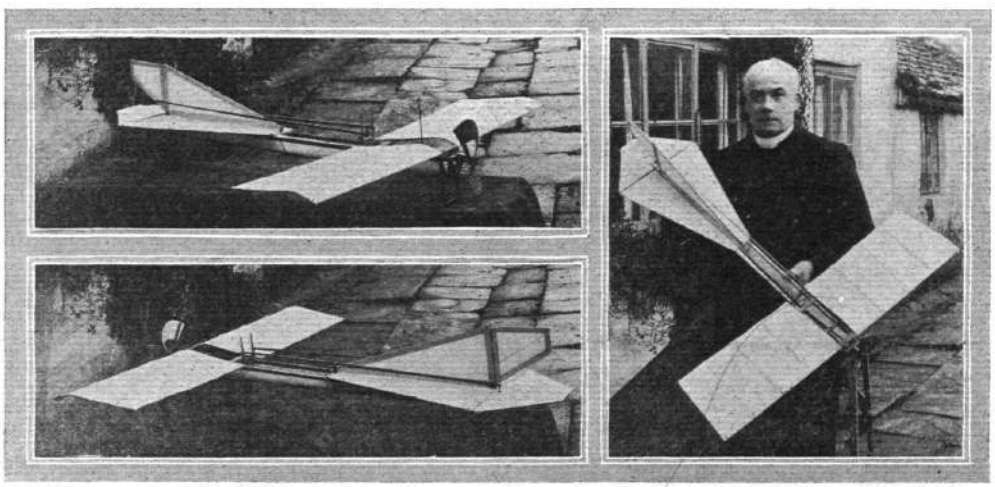
[In the judges' awards, published on page 217 of the current volume of FLIGHT, it was distinctly stated that Messrs. G. P. B. Smith and M. Jones received their awards for toy aeroplanes; our remarks on page 250 were based on these official awards. There is no doubt the judges had every desire to encourage original idea, but, as we pointed out in our article, it is a very serious matter to make an award for an idea if there is likely to be any implication thereby of official recognition of its value on full-sized machines. We do not think that makers of models should consider it beneath their dignity to have their machines officially classed as "toys"; certainly we do not believe that the judges would have awarded any prize to Mr. Smith unless his model had been an interesting and instructive device.—ED.]

THE NEGATIVE ANGLE.

[459] In reference to a model shown at Olympia with planes set at a negative angle, might I suggest that the apparent paradox is due to considering too closely the relation between the angle of the planes and the centre line of the machine.

The machine is not bound to maintain an even keel to the line of flight, and indeed the few flights which I witnessed gave me the impression that the body of the machine was tilted up, thus giving the planes a normal angle of entry.

I tried a few experiments with a small model glider, and was able to adjust the planes to both a positive and negative angle to the centre line, providing that they made the proper angle with each other depending on the centre of gravity. There seemed steadier



The Rev. J. W. Timson and his model.

flight at slightly negative angles, which I suggest is due to the lifting effect of the body moving through the air at an effective angle.

The following should prove an interesting experiment with the Olympia model. First put the planes parallel with the centre line of the machine, and adjust centre of gravity to make it glide. Then the effect of putting the front plane at a negative angle will, I think, cause the model to fall head first, showing less lift.

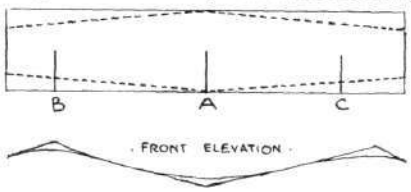
Thatcham. E. T. HAYNES.

[The question of a negative angle of incidence is, as our correspondent points out, very apt to give rise to a confusion of ideas. Setting the planes at a negative angle to the centre line of the body of the machine does not, as the above letter shows, necessarily imply a negative angle of the chord in flight. On the other hand, as we explained in the current volume, p. 237, a negative attitude of the chord in flight is by no means incompatible with the accepted theory of the stream line flow over a cambered aeroplane, and does not necessarily involve any new theory of vortex motion to explain the phenomenon of flight under such conditions. The really important angle is the angle of deflection, *i.e.*, the angle made by the tangent of the entering edge with the tangent of the trailing edge. This angle represents the amount that the relative wind has been deflected from its neutral path, always, of course, assuming that the entering edge is tangential to the relative wind in the first instance. We would refer our readers to the above-mentioned article for a further consideration of this subject, and hope they may see fit to discuss it, for the matter is one that is extremely interesting and important, and has a direct bearing on several constructional features, such as variable camber planes, which may quite possibly be introduced on later machines.—ED.]

PAPER GLIDER.

[460] I have lighted on a shape of glider which may possibly be interesting.

A piece of paper, 10 ins. by 1½ ins., is marked out as shown. It is cut halfway across at the lines A, B and C, and is cut away along



the dotted lines. The edges at A are drawn over each other to the extent of ⅛ in. and stuck together, so that the plane has now a concave form. The same is done at B and C, but with the concavity on the opposite side. The shape is now as shown in the second sketch.

It is ballasted by means of a light thin stick, stuck on at A. Length of stick should be adjusted so that the paper glides on an even keel (with the chord of each curve horizontal).

This glides with great stability and steadiness, free from the oscillation of dihedral angle gliders, lands smoothly, and exhibits great recovering power if capsized.

If made without cutting away along the dotted lines, it glides the other way up, with inferior stability. It seems to be a parachute, as it gives no thrust if rotated on a spindle.

I hope you will think this worthy of insertion.

North Finchley. F. C. HARROF.

AERONAUTICS FOR THE NAVY.

[461] I cannot agree with your correspondent (429), Engineer-Lieutenant Gush, R.N., that the scouting duties of aerocraft should be limited to the short quick passages, for which the aeroplane is only suited. Unless the aeroplanes were fitted with wireless, it would take as long to receive their reports as for them to return to the fleet, since the two actions would be identical. So that if the hostile fleet were visible an hour's flight away from the fleet, it would be an hour before news was obtained, and another two hours before it was confirmed by another aeroplane sent out. But with a dirigible maintaining station some 35 miles ahead of the fleet, commanding a wide radius of vision, and reporting by wireless, the time taken to transmit the intelligence would be small. So that it appears that the aeroplane would be only able to get glimpses of, and carry news of a hostile fleet, while the dirigible would be able to keep it under observation, transmit intelligence of its movements, and observe and report the units of which it was composed.

The dirigible's power of rapidly increasing its height, thereby extending its range of vision and rising out of danger, and its ability to *wait*, *watch* and *report*, makes it valuable as a scout. As a factor in blockade work and watching hostile coasts it will be of great service in allowing the fleet to lie in deep water and avoid working on a dangerous coast among outlying dangers and mines.

Your correspondent asks how I propose to supply the deficit o. reserve buoyancy in an aeroplane. I did not propose to do such a thing, but endeavoured to point our that this deficit was a serious drawback against the aeroplane being used for over-sea work.

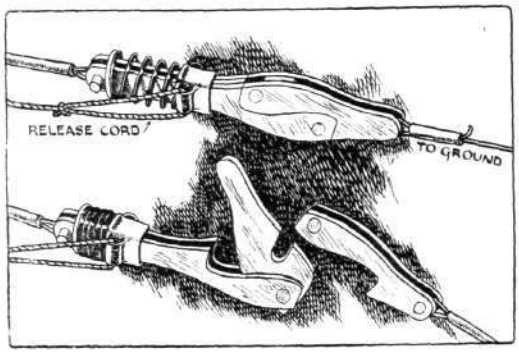
It would be better to increase the size and power of the dirigible, in order to obtain more speed, than to increase the horse-power alone, without adding to the buoyancy, because more power will be required to obtain extra speed, than resistance will be produced in obtaining greater lift. To reduce the resistance of the gas-bag by reducing its size, or to add to the vessel's engine-power, would be to decrease its useful lift, and consequently its radius of action, and power to rise quickly out of danger. No doubt the speed will be increased as the design of the gas-bag is improved, the weight of the engine reduced, and the efficiency of the propeller increased.

With reference to Miss Lilian Bland's suggestion to use a biplane kite from a vessel, the use of a kite will only extend the vessel's radius of observation by increasing the height of its observer, whereas, if a dirigible or aeroplane is used, the radius of observation will not only be extended by the greater height of the observer, but also by the radius of action of the aero-vessel itself. The use of a kite will still mean the presence of a marine scout, whereas by using a self-propelled form of aerocraft, a vessel need not be present. No doubt a kite would prove of much use on a vessel—whether naval or mercantile.

Pin Mill. HAROLD R. INGERSOLL.

ANCHOR SLIP DEVICE.

[462] I am enclosing herewith sketch of an ingenious anchoring slip device in which your readers may be interested. The slip device forms part of an anchoring rope, and takes the pull of the propeller, and prevents the movement of the machine. The object of the device is to enable starting to be effected by the operator alone, starting from any point. He merely drives a peg into the ground, and attaches a line from this peg to the machine to form an anchor, and the slip device is fitted in the rope with the end carrying the spring on the side towards the machine. The device thus takes the form of a hook, which can be slipped by the operator from the machine. The operator takes his place after he has started the engine, and as soon as he is ready he pulls the cord which is attached to the square sleeve. This draws back the sleeve, and



allows the hook part of the slip device to trip under the pull set up by the propeller. The device, therefore, comes in half, the small part being left attached to the peg, whilst the major portion is carried away by the machine. It is, therefore, necessary to carry a spare peg or two, and one or two small ends, one of which is, as you will see, left behind each time the machine is started. You will notice that it is impossible for the device to disengage until the sleeve is drawn right back, and also that it cannot be set inaccurately.

The device is the invention of Mr. D. G. Gilmour, of Bedford, who is at present at Pau practising with a cross-Channel type Blériot at the Blériot school. He has recently purchased this machine, and we shall probably shortly see him in England with it.

Coventry. ERIC W. WALFORD.

M. LE BLON'S ACCIDENT.

[463] Having read of the deplorable accident to M. Le Blon, it strikes me that in this case, similar to the fatal accident to M. Delagrange, the motor used was a rotary engine, and the accident occurred when the machine was taking a curve. These facts are

not mere coincidences, and I see in same the cause of the disaster, which is the gyroscopic effect of the motor, allowing all movements in the plane of its rotation and perpendicular to it, but no twisting movements in the form of sharp curves, which have as result the counteracting force of the gyroscope, tending to incline instantaneously the machine downwards or sideways.

I shall be pleased if, through your valuable paper, I succeed in drawing attention to this important subject, which I feel is worth consideration and will be of great interest to a wide aeronautical circle.

B. H. BALASSANIAN.

TIMBER.

[464] Could you tell me through your very interesting paper where I can obtain some wood—preferably birch $\frac{1}{16}$ in. or so diameter—for making the frame of the planes of a model biplane? I have seen some but do not know where it can be obtained.

Great Portland Street. F. H. SCHROEDER.

[Several advertisers in FLIGHT offer wood of all sizes.—ED.]

STREAM LINE PHOTOGRAPHY.

[465] I should like to know whether the following method of tracing and classifying the aerial movements in the atmosphere around an actually moving aeroplane has yet been tried :—

To form bands or belts of smoke, on a clear day, varying in thickness from a few inches to several feet, and to drive full-sized or model aeroplanes through these belts, at the same time recording the eddies and reactions by means of kinematography. I have often wondered what the vertical draught downward would be, and used to be amused as a boy at the pictures of Jules Verne's "Clipper of the Clouds," where the passengers appeared unconcernedly oblivious of the fearful downdraught from the helicopters.

Folkestone. JOHN L. DUNK.

[An investigation of stream line form by means of photographs of smoke-laden air was, as we have before pointed out, practised by F. W. Lanchester in connection with certain phases of his aerodynamic research, and has doubtless been applied by others, but we have not heard of any case in which anyone has attempted to use this method on a full-size scale machine. In this connection it is interesting to remark, however, that the dust trials carried out by the Royal Automobile Club involved the preparation of photographic records of dust clouds formed by the artificial covering of the course with flour before the passage of the car.—ED.]

MODELS.

[466] In reference to Mr. Mawdsley's letter (347) in February 12th, I think that an 8-in. tractor-screw would be suitable if the pitch is not too great. Eight strands of elastic, I think, will be sufficient, but if he finds that the model wants more power, try ten strands.

The propeller, when it is wound up fully, should last about ten seconds.

Thames Ditton. C. RIDLEY.

[467] In answer to Mr. R. W. Mawdsley's letter in the correspondence columns of FLIGHT (No. 34). I think a tractor-screw of 8 ins. would be too large; 6 ins. would be more suitable.

There should be about 15 to 20 strands of $\frac{1}{16}$ in. elastic, and the propeller should revolve for about 7 to 10 secs., which would give a flight of about 70 to 100 yards. I have built a lot of models of all fashions, and have had flights of 40 to 50 yards, and I have found that a very big tractor-screw does not give good results.

Boulogne. C. R. BENNETT.

[468] I would like to help your correspondent, Mr. R. W. Mawdsley (No. 347).

I can assure him that an 8 in. propeller is not too large, and I advise him to use a 9 in., with 28 strands of $\frac{1}{16}$ in. elastic. The time the propeller should run depends on the pitch of the blades.

I have a model of the same dimensions as Mr. Mawdsley's, but mine is 3 ozs. lighter than his. I use 24 strands of $\frac{1}{16}$ in. elastic with a 9 in. propeller, and it flies from a standing start 120 ft., rising to a height of 20 ft. I think your correspondent should increase the spread of the wings, and lengthen the body-piece which takes the elastic, and try to keep the weight at 7 ozs., and he will get better results.

Dundee. D. URQUHART.

[469] A 6-in. Cochrane propeller would, I think, be quite enough for Mr. Mawdsley's model. I find an 8-in. of the same make quite enough for a monoplane 3 ft. by 3 ft.

Mill Hill. O. J. SCHOLTZ.

DIARY OF FORTHCOMING EVENTS.

British Events.

1910.		1910.	
April 19	"Model Construction." Mr. G. P. B. Smith. Aero Models Association, Caxton House, S.W.	May 10	"Points on Construction and Design." Mr. T. W. K. Clarke. Aero Models Assoc.
April 20	"Scientific Model Construction." Mr. Richards. Manchester Aero Club.	May 14–21	Huntingdon.
April 20	Lecture by Mr. F. W. Lanchester. Midland Ae.C.	May 28	Balloon Race, Hurlingham.
April 26	"Classification of Models in Competition." Mr. P. K. Turner. Aero Models Assoc.	June 4	Kite and Glider Contests. Kite and Model Aeroplane Assoc.
April 28	Minor Meeting Aeronautical Society.	June 4–11	Doncaster.
May 3	"Supporting Surfaces and Propellers." W. G. Astor. Aero Models Assoc.	June 25–July 2	Wolverhampton.
May 7	Model Competition. Kite and Model Aeroplane Assoc.	July 2	Balloon Race, Hurlingham.
		July 16	Kite and Models Competition. Kite and Model Aeroplane Assoc.
		July 11–17	Bournemouth.*
		July 23	Balloon Race, Hurlingham.
		July 28–Aug. 3	Lancashire.
		Aug. 6–13	Lanark.*
		Aug. 15–20	Lancashire.

Foreign Events.

1910.		1910.	
April 10–25	Nice.*	June 26–July 10	Rheims.*
April 30–May 5	Tours.	July 24–Aug. 10	Belgium.
May 1–8	Seville.	Aug. 25–Sept. 4	Deauville.
May 10–16	Berlin.	Sept. 8–18	Bordeaux.
May 14–22	Lyons.	Sept. 24–Oct. 3	Milan.
May 15–22	St. Petersburg	Oct. 18–25	St. Louis. Gordon-Bennett Balloon Race.
May 17	Palermo.	Oct. 25–Nov. 2	America. Gordon-Bennett Aeroplane Race.
May 20–30	Verona.		
June 5–12	Vichy.		
June 5–15	Budapest.		

* International.

IMPORTS AND EXPORTS, 1910.

Aeroplanes, airships, balloons and parts thereof (not shown separately before 1910).

Imports.	£	Exports.	£	Re-Exportation.	£
January ...	2,516	January ...	750	January ...	550
February ...	437	February ...	2,950	February ...	—
March ...	7,516	March ...	128	March ...	600
3 months ...	10,469	3 months ...	3,828	3 months ...	1,150

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